

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicants: Christopher J. Bulian et al.      Docket No.: S-100,500

Serial No.:      Examiner:

Filed :      Art Unit:

For : PREPARATION OF TUNGSTEN OXIDE

Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

**INFORMATION DISCLOSURE STATEMENT**  
**UNDER 37 CFR 1.56, 1.97, AND 1.98**

Sir:

The documents listed below, copies attached, are submitted in compliance with the duty of disclosure defined in 37 CFR 1.56.

1. John A. Bailey et al., "Process For Producing Tungsten Oxide," U. S. Patent 5,911,965, issued June 15, 1999.

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**CERTIFICATE OF MAILING/TRANSMISSION (37 CFR 1.8(a))**

I hereby certify that this correspondence is, on the date shown below, being:

**MAILING**

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Date July 28, 2003

Samuel L. Borkowsky  
Signature

Samuel L. Borkowsky  
(type or print name of person certifying)

2. J. P. Cronin, D. J. Tarico, J. C. L. Tonazzi, A. Agrawal, and S. R. Kennedy, "Microstructure and Properties of Sol-Gel Deposited  $\text{WO}_3$  Coatings for Large Area Electrochromic Windows," *Solar Energy Materials and Solar Cells*, vol. 29, pp. 371-386, 1993.
3. M. A. Reiche, P. Hug, and A. Baiker, "Effect of Grafting Sequence on the Behavior of Titania-Supported  $\text{V}_2\text{O}_5$ — $\text{WO}_3$  Catalysts in the Selective Reduction of NO by  $\text{NH}_3$ ," *Journal of Catalysis*, vol. 192, pp. 400-411, 2000.
4. Masayoshi Kaneyasu et al., "Gas Detecting Apparatus," U. S. Patent 4,586,143, issued April 29, 1986.
5. David Edward Williams et al., "Resistive Gas Sensing, Especially For Detection of Ozone," U. S. Patent 5,811,662, issued September 22, 1998.
6. Xusheng Wang, Norio Miura, and Noboru Yamazoe, "Study of  $\text{WO}_3$ -Based Sensing Materials for  $\text{NH}_3$ , and NO Detection," *Sensors and Actuators B*, vol. 66, pp. 74-76, 2000.
7. I. Ruokamo, T. Karkkainen, J. Huusko, T. Ruokanen, M. Blomberg, H. Torvela, and V. Lantto, " $\text{H}_2\text{S}$  Response of  $\text{WO}_3$  Thin-Film Sensors Manufactured By Silicon Processing Technology," *Sensors and Actuators B*, vol. 18-19, pp. 486-488, 1994.
8. Marshall Leibowitz et al., "Method for Making Electrochromic Films Having Improved Etch Resistance," U. S. Patent 4,233,339, issued November 11, 1980.
9. Ismael Jimenez, Jordi Arbiol, Albert Cornet, and Joan Ramon Morante, "Structural and Gas-Sensing Properties of  $\text{WO}_3$  Nanocrystalline Powders Obtained by a Sol-Gel Method From Tungstic Acid," *IEEE Sensors Journal*, vol. 2, no. 4, pp. 329-335, August 2002.
10. Shahid Pirzada et al., "Method of Producing Nanoscale Powders By Quenching of Vapors," U. S. Patent 5,788,738, issued August 4, 1998.
11. M. Regragui, M. Addou, A. Outzourkit, J. C. Bernede, Elb. El Idrissi, E. Benseddik, and A. Kachouane, "Preparation and Characterization of Pyrolytic Spray Deposited Electrochromic Tungsten Trioxide Films," *Thin Solid Films*, vol. 358, pp. 40-45, 2000.

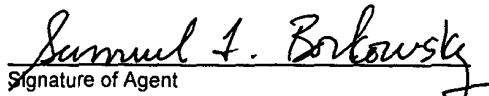
12. John P. Cronin et al., "Precursor Solutions for Forming Coatings," U. S. Patent 5,525,264, issued June 11, 1996.
13. Clint Bickmore et al., "Combustion of Emulsions: A Method and Process for Producing Fine Powders," U. S. Patent 5,984,997, issued November 16, 1999.
14. Morito Akiyama, Jun Tamaki, Norio Miura, and Noboru Yamazoe, "Tungsten Oxide-Based Semiconductor Sensor Highly Sensitive to NO and NO<sub>2</sub>," Chemistry Letters, pp. 1611-1614, 1991.
15. M. Gotic, M. Ivanda, S. Popovic, and S. Music, "Synthesis of Tungsten Trioxide Hydrates and Their Structural Properties," Materials Science and Engineering, vol. B77, pp. 193-201, 2000.
16. Cs. Balazsi, M. Farkas-Jahnke, I. Kotsis, L. Petras, and J. Pfeifer, "the Observation of Cubic Tungsten Trioxide at High-Temperature Dehydration of Tungstic Acid Hydrate," Solid State Ionics, vol. 141-142, pp. 411-416.
17. Cs. Balazsi, "Development of Tungsten Oxide Hydrate Phases During Precipitation-Washing-Ripening Process," Materials Structure, vol. 6, num. 6, pp. 135-139, 1999.

This Information Disclosure Statement is not to be construed as a representation that a search has been made or that additional matter material to the examination of this application does not exist. Applicant does not believe that any of these citations constitutes prior art under 35 U.S.C. 102.

It is requested that the above citations be made of record in the prosecution of this application.

Respectfully submitted,

Date: July 28, 2003  
Reg. No. 42,346  
Phone (505) 665-3111

  
Signature of Agent  
Samuel L. Borkowsky  
Los Alamos National Laboratory  
LC/IP, MS A187  
Los Alamos, New Mexico 87545

Form PTO-1449 (Modified)	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No.  S-100,500	Serial No.
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>		Applicant(s)  Christopher J. Bulian et al.	
		Filing Date	Group

37 CFR 1.98(b)

**U.S. PATENTS DOCUMENTS**

EXAMINER INITIAL	PATENT NUMBER									ISSUE DATE	PATENTEE	CLASS	SUB CLASS	FILING DATE
			5	9	1	1	9	6	5	06/15/1999	John A. Bailey et al.	423	606	01/23/1998
			4	5	8	6	1	4	3	04/29/1986	Masayoshi Kaneyasu et al.	364	509	01/28/1983
			5	8	1	1	6	6	2	09/22/1998	David Edward Williams et al.	73	31.06	06/20/1995
			4	2	3	3	3	3	9	11/11/1980	Marshall Leibowitz et al.	427	108	10/23/1978
			5	7	8	8	7	3	8	08/04/1998	Shahid Pirzada et al.	75	331	09/03/1996
			5	5	2	5	2	6	4	06/11/1996	John P. Cronin et al.	252	583	06/02/1995
			5	9	8	4	9	9	7	11/16/1999	Clint Bickmore et al.	75	343	03/23/1998

**FOREIGN PATENT DOCUMENTS**

EXAMINER INITIAL	PATENT NUMBER								ISSUE DATE	COUNTRY	CLASS	SUB CLASS	Translation YES NO	

**OTHER DOCUMENTS** (Including Author, Title, Date, Place of Publication)

	J. P. Cronin, D. J. Tarico, J. C. L. Tonazzi, A. Agrawal, and S. R. Kennedy, "Microstructure and Properties of Sol-Gel Deposited WO <sub>3</sub> Coatings for Large Area Electrochromic Windows," Solar Energy Materials and Solar Cells, vol. 29, pp. 371-386, 1993
	M. A. Reiche, P. Hug, and A. Baiker, "Effect of Grafting Sequence on the Behavior of Titania-Supported V <sub>2</sub> O <sub>5</sub> -WO <sub>3</sub> Catalysts in the Selective Reduction of NO by NH <sub>3</sub> ," Journal of Catalysis, vol. 192, pp. 400-411, 2000
	Xusheng Wang, Norio Miura, and Noboru Yamazoe, "Study of WO <sub>3</sub> -Based Sensing Materials for NH <sub>3</sub> , and NO Detection," Sensors and Actuators B, vol. 66, pp. 74-76, 2000

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\*EXAMINER: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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	I. Ruokamo, T. Karkkainen, J. Huusko, T. Ruokanen, M. Blomberg, H. Torvela, and V. Lantto, "H <sub>2</sub> S Response of WO <sub>3</sub> Thin-Film Sensors Manufactured By Silicon Processing Technology," Sensors and Actuators B, vol. 18-19, pp. 486-488, 1994		
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	M. Regragui, M. Addou, A. Outzourkit, J. C. Bernede, Elb. El Idrissi, E. Benseddik, and A. Kachouane, "Preparation and Characterization of Pyrolytic Spray Deposited Electrochromic Tungsten Trioxide Films," Thin Solid Films, vol. 358, pp. 40-45, 2000		
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